

WHAT IS CLAIMED IS:

- 1           1.     A signal transfer point node within a Signaling System 7 (SS7)
- 2           telecommunications network serving a particular local switch and further connected
- 3           to a packet communications network, comprising:
- 4                 a first interface for receiving a SS7 signal from said particular local switch,
- 5           said SS7 signal having a destination address within said SS7 telecommunications
- 6           network;
- 7                 a first routing table for determining the routing mechanism within said SS7
- 8           telecommunications network;
- 9                 a second routing table for determining the routing mechanism within said
- 10          packet communications network; and
- 11                 a processor for determining whether said destination address associated
- 12          with said received SS7 signal is specified within said second routing table.

1           2.     The signaling transfer point node of Claim 1 further comprising:  
2                     a second interface for communicating packet data with said packet  
3                     communications network; and  
4                     an interworking function module connected to said second interface for  
5                     encapsulating said SS7 signal within a packet and for transmitting said packet over  
6                     said second interface.

1           3.     The signaling transfer point node of Claim 2 wherein said interworking  
2                     function module utilizes Message Transfer Part 3 - User Adaptation Layer (M3UA)  
3                     protocol to communicate said SS7 signal over said packet communications  
4                     network.

1           4.     The signal transfer point node of Claim 1 further comprising:  
2                     a third interface for communicating said received SS7 signal over said SS7  
3                     telecommunications network; and  
4                     wherein said processor transmits said received SS7 signal over said third  
5                     interface in response to a determination that said destination address associated  
6                     with said received SS7 signal is specified within said first routing table.

1        5.     The signal transfer point node of Claim 1 wherein said packet  
2        communications network further comprising:

3                an address server for maintaining address data for a plurality of  
4        communications nodes within said packet communications network;

5                a plurality of said STPs connected to said packet communications network;

6        and

7                wherein said server communicates said address data to said plurality of  
8        STPs over said packet communications network;

1        6.     The signaling transfer point node of Claim 1 wherein said first routing table  
2        comprises a point code (PC) table for said destination address.

1           7.     The signaling transfer point node of Claim 1 wherein said second routing  
2           table comprises an Internet Protocol (IP) address table for a particular signaling  
3           transfer point serving a destination local switch associated with said destination  
4           address.

1           8.     The signaling transfer point node of Claim 1 wherein said first interface  
2           comprises a trunk interface with said local switch.

1        9.    A method of communicating a SS7 signal over a packet based  
2        communications network wherein said SS7 signal is originated from a local switch  
3        connected to a SS7 telecommunications network, further comprising the steps of:  
4                receiving a SS7 signal from said local switch, said SS7 signal indicating a  
5        destination address within said SS7 telecommunications network;  
6                determining whether said destination address indicated by said received  
7        SS7 signal is specified within a routing code table indicating that said destination  
8        address is reachable by said packet based communications network;  
9                in response to said determination, routing said SS7 signal over said packet  
10       based communications network using a determined routing code as the destination  
11       address within said packet based communications network;  
12               otherwise,  
13               determining whether said destination address indicated by said received  
14       SS7 signal is specified within a point code table indicating that said destination  
15       address is reachable by said SS7 telecommunications network; and  
16               in response to said determination, routing said SS7 signal over said SS7  
17       telecommunications network.

1        10.    The method of claim 9 wherein said step of determining whether said  
2        destination address is specified within said routing code table is performed by a  
3        first signal transfer point (STP) connected to said local switch.

1        11.    The method of claim 10 wherein said step of routing said received SS7  
2        signal over said packet based communications network further comprises the steps  
3        of:

4                identifying an Internet Protocol (IP) address associated with a second signal  
5        transfer point (STP) serving a destination local switch associated with said received  
6        destination address within said routing code table;

7                encapsulating said received SS7 signal within an Internet protocol (IP)  
8        based packet; and

9                routing said IP packet using said identified IP address associated with said  
10       second STP as the destination address over said packet based communications  
11       network.

1           12.    The method of Claim 11 further comprises the step of utilizing Message  
2           Transfer Part 3 – User Adaptation Layer (M3UA) protocol to transmit said received  
3           SS7 signal over said product based communications network and to support peer-  
4           to-peer signaling.

1           13.    The method of Claim 11 wherein said step of routing said received SS7  
2           signal over said SS7 telecommunications network further comprises the step of said  
3           first STP routing said received SS7 signal over said SS7 telecommunications  
4           network using said point code as the destination address.

1           14.    The method of Claim 9 further comprising the steps of:  
2                    receiving an address update packet signal from a centralized server; and  
3                    updating said routing code table with data received within said address  
4           update packet signal.

- 1        15.    The method of Claim 14 wherein said SS7 telecommunications network  
2        includes a plurality of signal transfer points (STPs), each including said routing  
3        code table, wherein each of said STPs further receiving said address update packet  
4        signal from said centralized server for updating said routing code table.

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1        16. A system for communicating a SS7 signal over a packet based  
2        communications network wherein said SS7 signal is originated from a local switch  
3        connected to a SS7 telecommunications network, further comprising:

4                means for receiving a SS7 signal from said local switch, said SS7 signal  
5        indicating a destination address within said SS7 telecommunications network;

6                means for determining whether said destination address indicated by said  
7        received SS7 signal is specified within a routing code table indicating that said  
8        destination address is reachable by said packet based communications network;

9                in response to said determination, means for routing said SS7 signal over  
10       said packet based communications network using a determined routing code as the  
11       destination address within said packet based communications network;

12               otherwise,

13               means for determining whether said destination address indicated by said  
14       received SS7 signal is specified within a point code table indicating that said  
15       destination address is reachable by said SS7 telecommunications network; and

16               in response to said determination, means for routing said SS7 signal over  
17       said SS7 telecommunications network.

1 17. The system of claim 16 wherein said means for determining whether said  
2 destination address is specified within said routing code table comprises a first  
3 signal transfer point (STP) connected to said local switch.

1 18. The system of Claim 17 wherein said means for routing said received SS7  
2 signal over said packet based communications network further comprises:

3 means for identifying an Internet Protocol (IP) address associated with a  
4 second signal transfer point (STP) serving a destination local switch associated with  
5 said received destination address within said routing code table;

6 means for encapsulating said received SS7 signal within an internet  
7 protocol (IP) based packet; and

8 means for routing said IP packet using said identified IP address as the  
9 destination address over said packet based communications network.

1 19. The system of Claim 18 further comprises means for utilizing Message  
2 Transfer Part 3 – User Adaptation Layer (M3UA) protocol to transmit said received  
3 SS7 signal over said packet communications network.

1           20.    The system of Claim 18 wherein said first STP further comprises means  
2           for routing said received SS7 signal over said SS7 telecommunications network  
3           using said point code as the destination address.

1           21.    The system of Claim 16 further comprising:  
2                    means for receiving an address update packet signal from a centralized  
3           server; and  
4                    means for updating said routing code table with data received within said  
5           address update packet signal.

1           22.    The system of Claim 21 herein said SS7 telecommunications network  
2           further comprising a plurality of signal transfer points (STPs), each comprising  
3           said routing code table, wherein each of said STPs further comprising means for  
4           receiving said address update packet signal from said centralized server for  
5           updating said routing code table.